



NAture **I**nsurance value: **A**ssessment and **D**emonstration

NAIAD Case Studies:
Glinščica
Demonstration Site



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NAIAD CASE STUDIES: GLINŠČICA DEMONSTRATION SITE

The aim of Slovenian demo is to prepare a comparison of Nature based solutions and grey scenarios for the Glinščica catchment area, evaluate the ecosystem services provided by implementation of restoration and management measures developed within the project and to develop and deploy economic and/or financial instruments (in the form of nature assurance schemes) for effective business models in the field of ecosystem services, green infrastructure and river restoration that would highlight the importance of understanding the value of ecosystems in the long run.

Glinščica catchment is situated within the borders of the Municipality of Ljubljana that spans roughly 275 km² and has a population of 284,000 inhabitants. About three quarters of the city is covered with green areas - rivers, forests and agricultural areas. Over the last decade, the Municipality of Ljubljana has implemented numerous urban green measures and became the European Green Capital in 2016.

THE DEMO SITE:

- covers 7.01% of Ljubljana's surface area,
- includes 5 of its districts (Dravljje, Šiška, Rožnik, Vič, Šentvid),
- and accounts for 8.17% (23,200) of its population.

Urban watercourses in Ljubljana are seen as an important component of urban green systems primarily as a network of natural areas which stretch into the urban structure and introduce natural landscape elements in the urban area. However, the lower reaches of Glinščica have been trapped in a concrete channel for several decades and other forms of regulations extend upstream to the mountainous headwaters. Inappropriate regulations are reflected mainly in the high frequency of flood events and low species diversity. Fast drainage through the straightened stream channel brings the flood wave directly into the city center.

ESTIMATED DAMAGE CAUSED BY FLOODS IN 2014 (Municipality of Ljubljana):

- houses and buildings: 4.5 million €,
- Agriculture: estimated 33,000.00 €,
- Infrastructure: 1.9 million €,
- Watercourses: 8.31 million €.

Municipality of Ljubljana allocated 5 million € to flood protection measures after the floods
(*Poplave v Ljubljani, 2014*).

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Straightened channel and lack of riparian vegetation have also reduced the aesthetic and educational value of the stream as well as the status of the water environment and thus the experiential value of the stream. Therefore, Glinščica ceased to constitute a basis for many of its functions as an urban green corridor:

- hydrological,
- ecological,
- spatio-structural,
- aesthetic,
- sports and recreational,
- and social.

We are researching innovative approaches of water management practices. We can simultaneously address different interests of stakeholders by applying participative planning of Nature Based solutions that can provide multiple benefits, such as:

- decreasing flood risks,
- decreasing flood damage and costs,
- improved ecological status of the river,
- and additional recreational spaces for local inhabitants.

This would benefit the people, environment and economy.

NBS BEING TESTED:

- Dry retention area (reservoir)
- Opening flood plain
- River renaturation /re-meandering
- Urban dry retention area (urban park)
- Decentralized house rainwater reservoirs
- Existing dry retention area (reservoir)

PRIORITIES:

- Cooperation with stakeholders
- Freestation measuring station implementation

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We are **engaging local stakeholders** to devise NBS through bottom-up approach, taking advantage of local knowledge to contribute to the expert analysis. A series of interviews and workshops have proven highly interesting for all - governmental, regional and municipal representatives, as well as individual residents and farmers. Each new activity that we implement receives more interest, input and feedback from stakeholders. Our **2nd workshop at Municipality of Ljubljana** in 2018 was attended by all stakeholders that we have identified as important to contribute to our efforts on the Glinščica demo. Stakeholders gave us great feedback, they are very enthusiastic and interested in cooperating and attending our practical workshops.

RESULTS OF THE WORKSHOP:

- The key result of this workshop was that the stakeholders are aware of the need to implement different types of measures, to increase the benefits and co-benefits of the chosen NBS. To be more precise, the stakeholders are now aware of the role of the institutional measures, that can either prevent or increase the efficiency and effectiveness of urban and regional spatial implementation plan. The next phase of stakeholder activities at the Glinščica demo will be focused on defining implementation costs of the chosen NBS and soft/institutional measures.
- We were thrilled that so many people joined our workshop, with various professional backgrounds and all of them showed a lot of interest and motivation for cooperation and exchange of ideas and thoughts. All attendees of the workshop expressed their desire for more similar events with interdisciplinary cooperation in the form of workshops, preparation of economic analysis of individual NBS measures (economic effects, investment costs and financial efficiency), as well as preparation of a proposal for renovating and management of the Glinščica watershed with implementing NBS and soft measures, with concrete and complex measures on specific spots on the watercourse.

It is common for the public opinion to be against such development plans, simply because the general public is usually not included into the planning process since the beginning. In such cases, implementation processes can become delayed by up to several years. With our inclusive approach, initial planning phase does take a bit longer to finish, because at each step, we have consulted with and discussed the process with our stakeholders. But, nevertheless, in the end, the implementation process:

- has no complications or specific issues, and is being executed promptly with no delays,
- and since the stakeholders (local inhabitants) have been included into the development process since the very beginning, they feel connected to the proposed common solution and take ownership in it, so they also feel motivated to help with maintenance and potential upgrades or additional processes that might be necessary in the future.

FreeStation measuring station is going to be implemented at Glinščica demo in summer of 2019.

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FREESTATION: HOW DOES IT WORK?

The **Freestation** is intended to be used in areas where national monitoring network is not yet implemented or predicted, but the data would be highly valuable to either local interest groups, residents or municipalities. Since it is much cheaper than most other monitoring stations (one FreeStation costs around 200 \$), it is realistic to expect that all stakeholders would be able and willing to invest in such equipment, given the benefits. The FreeStation is made by "open source" principle, so research data can be accessed by anyone. Precise instructions for ordering specific parts and building the Freestation yourself are also available online for free. Gathered data from the Glinščica demo will be available to the general public online, where it is going to be used in various analyses and forecasts of flooding. The data that is being collected is: Air temperature, humidity of air, air pressure and water level(s), it can as well be upgraded with data measurements of rainfall and wind speed. Data are collected and recorded into a Google Sheet. Data is being transferred through a telephone network or wi-fi network, by using a SIM card. Using the solar panels, electricity is provided from the sun, which is why the FreeStation is completely independent and can be implemented also in very remote areas, besides that, the maintenance demands are minimal (requirement is that solar panels are clean and without any damages from rainstorms). Data can be collected every hour or every minute. Data can also be collected continually, depending on capacity of the battery. The more data, the faster the battery empties out. As there is not a lot of sun in rainy seasons, a compromise is needed.

THE MAIN RESULTS WE EXPECT FROM OUR WORK ON THE DEMO SITE:

The aim of our work on the Glinščica Demo is:

- to show that it is possible to find common environmentally-friendly solutions, if we use the right approach by including all the stakeholders already into the initial planning phase of development activities and not only after the plans have already been made, as well as actually taking into consideration what their wants and needs are.
- to represent an example of good practice in successful spatial planning implementation process and to prove, that by including the stakeholders into the process, we can shorten the lengthy process from the planning phase, up to implementation phase.

Benefits from project results: In the Project NAIAD, we will prepare a proposal for implementing NBS, that would help Glinščica demo reach 2 main goals, that were set by the stakeholders:

- **Improve flood safety and simultaneously improve the ecological status of the catchment.** These future measures have been hydrologically modelled, thus we have predicted (possible) impact on the scope and depth of flooded areas, as well as prepared an evaluation of the value of these implemented measures, based on the opinions and suggestions of stakeholders
- so, by comparing different scenarios, we are going to figure out which measures are the best to be chosen from the financial aspect, as well as from the aspect of experiential, educational and other non-financial values.

We will prepare a proposal of implementation of Nature based solutions for the Municipality of Ljubljana, with the aim to be actually implemented and realized as a demonstration project.

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WHY ARE NATURE BASED SOLUTIONS A BETTER CHOICE FOR FLOOD MITIGATION?

Glinščica stream has been regulated for almost a century, so local population does not even remember its natural state and don't understand why restoration is required to reach a better ecological state. Lack of bank vegetation and straightened, concrete stream channels are causing overheating, providing little to no shelter or habitat for fish and invertebrates, as well as preventing sediment transport in the Glinščica stream. In addition, the regulations are causing faster drainage, that results in downstream flooding. Proposed Nature based solutions will slow the flow and dissipate water energy, provide habitat for fish and invertebrates, enable sediment transport and mitigate overheating and flooding. Besides direct benefits to the stream, the proposed NBS will also enhance the visual and recreational value of the area.

THE MAIN MESSAGE OF GLINŠČICA DEMO:

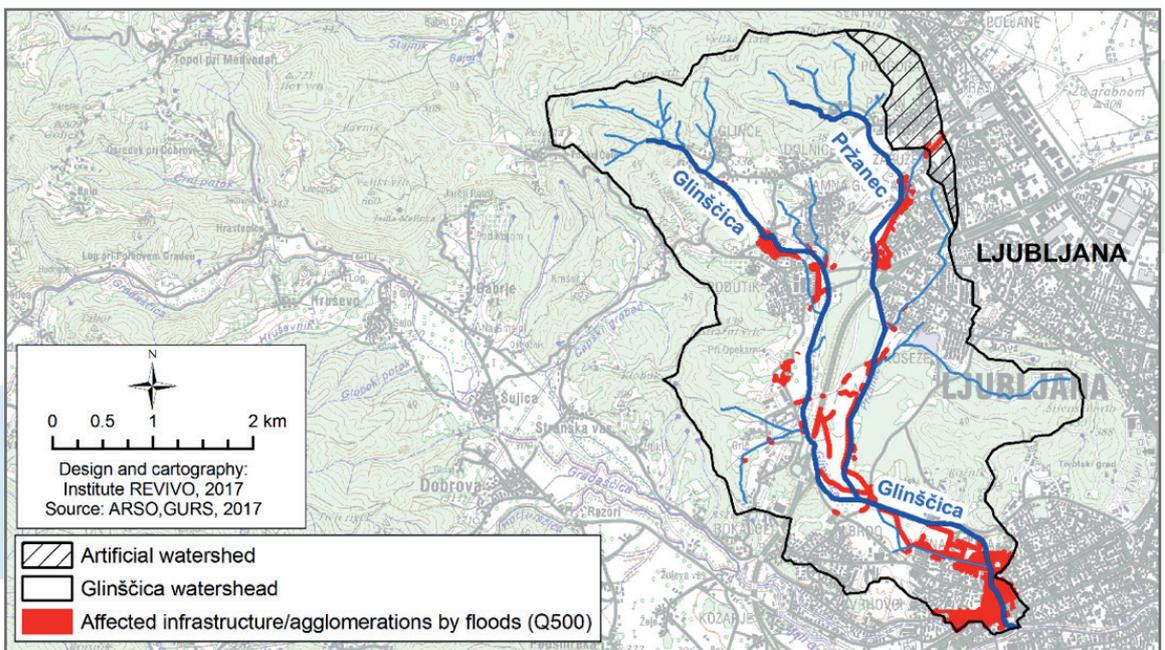
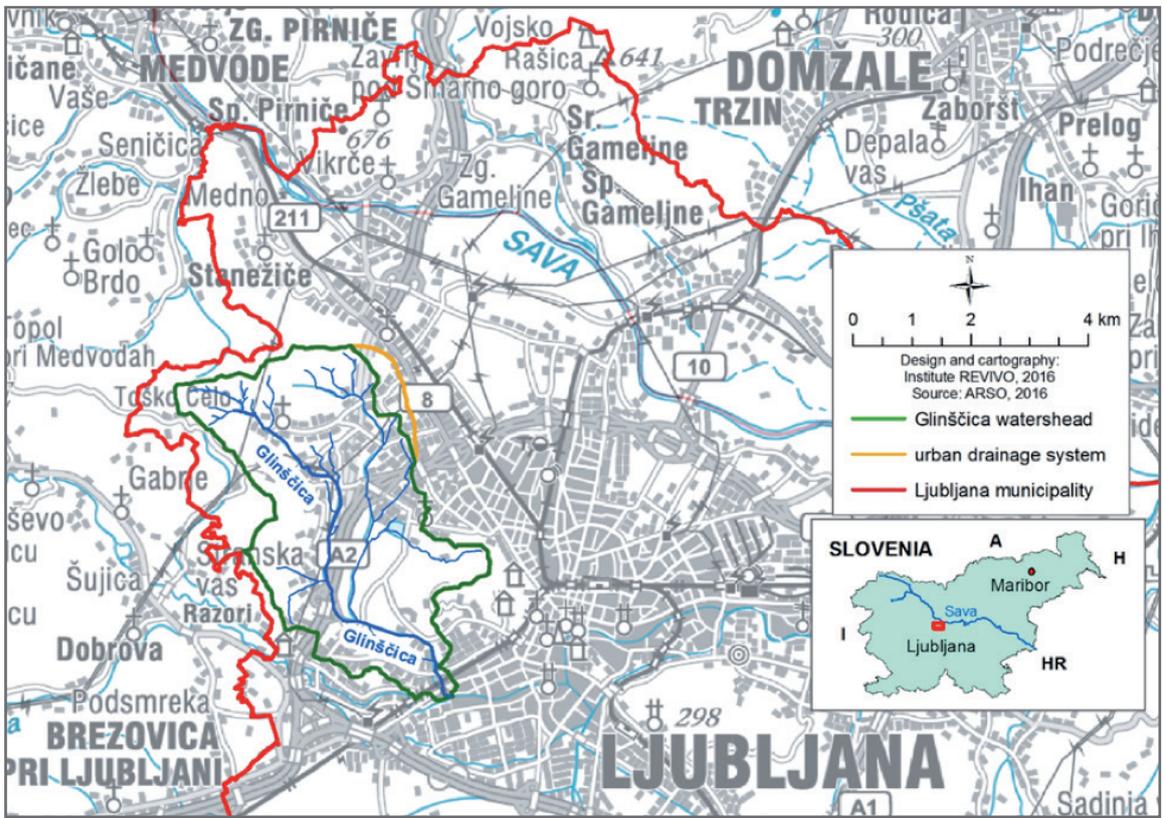
We intend to start a process of modernization of the outdated and inadequate practices still in use in water management in Slovenia. We will develop a strategy for water risk mitigation using nature based solutions for the Glinščica catchment and present it as a viable alternative to existing, grey plans. We plan to build capacity and change perceptions of stakeholders about nature-based solutions, their effectiveness and their potential to provide multiple co-benefits in addition to main required benefits of flood protection and restoration of ecological status. Local residents and the Municipality will consequently support the shift of water management practices towards green solutions.

Author: Dr. Polona Pengal, Institute Revivo (WP6 co-leader & Glinščica Demo leader)

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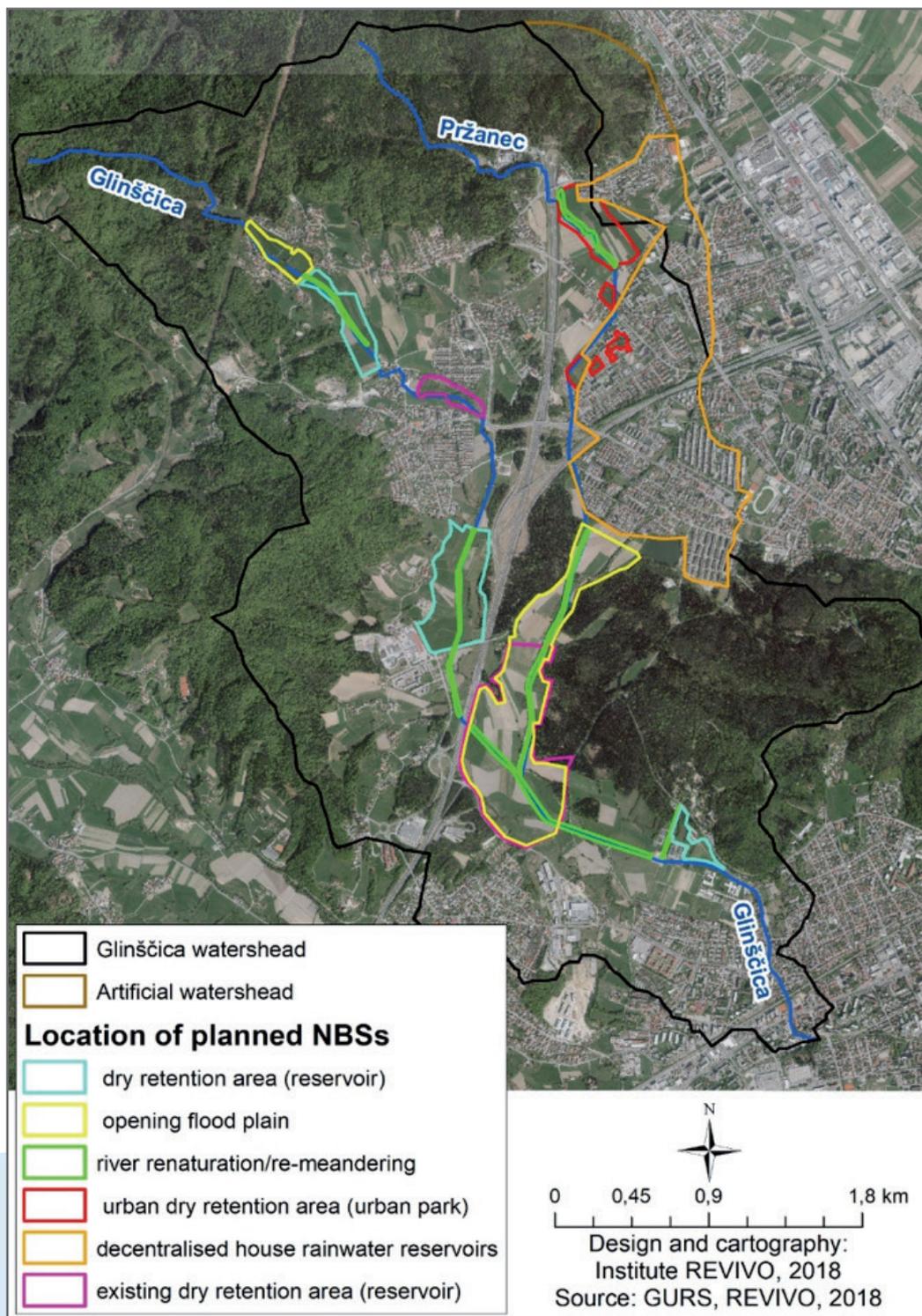
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You can find out more about Glinščica Demo in this short video: <https://www.youtube.com/watch?v=T765d4LINr4>, where Dr. Polona Pengal from Revivo Institute shortly describes the issues the area faces, as well as possible solutions that are being researched and evaluated.

As the project is still under way, the final results are not yet available. We are expecting the results of economic assessment to be available in the 2nd half of 2019.

Video by [Zavod Iskriva, iskrišče za razvoj lokalnih potencialov](#).

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About the NAIAD Project

'NAIAD' (Nature Insurance Value – Assessment and Demonstration) is an advanced, first of a kind, EU Horizon 2020 applied research programme focused on Nature Based Solutions (NBS) in risk management strategies, with a focus on water. NAIAD aims to operationalize the insurance value of ecosystems to reduce the human and economic cost of risks associated with water (floods and drought) by developing and testing - with key insurers and municipalities - the concepts, tools, applications and instruments (business models) necessary for its mainstreaming.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730497.



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